circles define an annular region around the axis that is empty of lines but which represents the tolerance on size.--

In the claims:

Please amend the claims as follows:

2. (Amended) The method of claim 1 where representing each tolerance zone for each geometric feature of said object comprises creating a tolerance map in three dimensions representing a plane.

3. (Amended) The method of claim 1 where representing each tolerance zone for each geometric feature of said object further comprises creating a tolerance map in four dimensions representing a line, axis or edge.

4. (Amended) The method of claim 1 where representing each tolerance zone for each geometric feature of said object further comprises creating a tolerance map in five dimensions representing the tolerances for each cylindrical surface, including tolerance on size and the tolerance-zone for the position of the axis of the cylindrical surface.

5. (Amended) The method of claim 1 where representing each tolerance zone for each geometric feature of said object comprises creating a tolerance map representing a position.

8. (Amended) The method of claim 1 where representing each tolerance zone for each geometric feature, or combination of geometric features, of said object comprises creating a tolerance map in a space of points that represent the variational possibilities of manufacture for the features of said object.

9. (Amended) The method of claim 1 where representing each tolerance zone for each geometric feature, or cluster of geometric features, of said object comprises creating a tolerance map in a space of points that represent the variational possibilities of manufacture for the features of features of said object expressed in areal (barycentric) coordinates.

11. (Amended) The method of claim 1 where computing in said computer interdependencies between said stored maps and interdependencies between submaps of said stored maps comprises superimposing on a tolerance zone of said geometric feature a tolerance zone specifying form including flatness, straightness and cylindricity of said geometric feature.

Please cancel claims 13, 14, 15 and 20 without prejudice.

Please add the following new claims:

--21. The method of claim 1 where representing each tolerance for each geometric feature further includes representing tolerances for each tab or slot feature by generating a tolerance map in four dimensions that represents each feature, including the tolerance on feature size and the tolerance-zone for feature mid-plane.--

--22. The method of claim 1 further including representing a symmetry tolerance zone for features including a tab, slot, or cylinder, having two tolerances on size and the symmetry for relative position of feature mid-planes and/or axes, by creating a tolerance map in five dimensions to represent the symmetry of the tab or slot feature, or in six dimensions to represent the symmetry of the cylinder feature.--

--23. The method of claim 1 where further including representing the tolerances for a cluster of features including a point and a line, or a plane and a line, by creating a tolerance map of a dimension higher than the dimensions of a tolerance map for either feature individually, but lower than the sum of the individual dimensions of a tolerance map for either feature.--

--24. An apparatus for analyzing geometric variations (tolerances) to integrate parametric CAD with tolerance analysis and optimization of a manufactured object comprising a computer wherein is stored:

a geometry engine module E1 to generate a B-rep solid model of said object;

a constraint solver E2 to generate a D&T graph of said object;

a geometry definition system M1 communicated to said geometry engine module E1 and constraint solver E2;

a dimensioning module M2 for receiving said B-rep solid model and said D&T graph as input data;

a tolerancing module M4 communicating with said dimensioning module M2;

a global visualization module M3 communicating with said tolerancing module M4;

a D&T Schema Advisor module M5 communicating with said tolerancing module M4;

a tolerance allocation module M6 communicating with said tolerancing module M4;

a local model visualization module M7 communicating with said tolerance allocation module M6 for providing a geometric visualization of tolerancing of said object; and